

the author has discarded his bizarre hypothesis that the black cloud consists of "carbon gases" produced by the distillation of beds of asphalt in Tertiary deposits beneath the volcano. He is now of the same opinion as other scientific men, viz., that the main constituents of the cloud were steam, hot dust and sulphurous acid. We can hardly pass without remark his extraordinary calculations of the amount of dust ejected by Montagne Pelée during the latter part of 1902. He arrives at the conclusion that 480 millions of cubic feet of solid sediment have been discharged every hour, and is inclined to believe that this is an under-estimate. So far at least as regards that period when we were in Martinique in July, this is a wild exaggeration. For hours at a time the volcano emitted hardly a puff of steam; a casual visitor might never have suspected that the deep gully near the summit led into the crater; the amount of dust discharged was negligible. Yet this was the period immediately preceding and immediately following the eruption of July 9, which was one of the most important eruptions of last summer. When Prof. Heilprin adds, "We ask ourselves the questions—What becomes of the void that is formed in the interior? What form of new catastrophe does it invite?" we seem to hear the echo of the dire predictions which resounded in the colonial journals about twelve months ago.

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EXPERIMENTS ON ANIMALS.

Experiments on Animals. By Stephen Paget. 1p. xvi+387. New and revised edition. (London: Murray, 1903.) Price 6s.

A BOOK which reaches a second edition in two years can do so only in response to some distinct demand, and such a demand is in itself no little recommendation as to its merits. The author of the book, Mr. Stephen Paget, was for twelve years secretary to the Association for the Advancement of Medicine by Research, and it was therefore his business "to know something about experiments on animals, and to follow the working of the (Vivisection) Act of 1876." He is therefore to a peculiar degree competent to write a book dealing with these subjects, and it is a matter for congratulation that the council of the Association above mentioned decided that the book should be written with a view to general reading. Though in this present edition all references to anti-vivisection societies and their methods are very wisely omitted, yet the obvious purpose of the book is to combat the misleading statements which these societies have disseminated broadcast amongst the un-instructed public, and to afford information concerning the results achieved by such experiments on animals, whereby the public may be enabled to judge for themselves as to the claims of the anti-vivisectionists. To quote Lord Lister, who writes an introduction to this volume,

"The action of these well-meaning persons is based upon ignorance. They allow that man is permitted to inflict pain upon the lower animals when

some substantial advantage is to be gained; but they deny that any good has ever resulted from the researches which they condemn."

Mr. Paget's object is therefore to convey to the general reader some idea of the inestimable advantages which have accrued to medical science from experimental research on animals. In the closing pages of the book, moreover, he points out that the vast majority of the experiments carried out at the present day in Great Britain involve no pain at all to the animals operated upon. The comparatively few animals subjected to painful experiment

"cannot be compared with the same number of horses, cattle, or sheep mutilated by breeders and farmers; for these mutilations are done, some of them, without any anæsthetic. They cannot be compared with the same number of pheasants or rabbits badly wounded, but not killed, in sport; for the animals thus wounded receive no subsequent care, and, if they are in pain, nobody puts them out of it."

To come to the actual contents of the book, we find that Mr. Paget devotes more than 200 pages to the consideration of experiments in bacteriology, but only 84 pages to experiments in physiology. It is to be regretted that the subject which forms the foundation of all medical science should be treated so cursorily, but in excuse it may be admitted that the practical importance of much physiological work is indirect, whilst that of bacteriological work is obvious and immediate.

In his account of experiments in physiology, Mr. Paget gives a concise *résumé* of certain chapters in the history of physiology. The circulation of the blood is treated rather more fully than other subjects, though Harvey's work receives but four pages of description and quotation. In the chapter on gastric juice, Mr. Paget very pertinently refers to the well-known case of Alexis St. Martin, in whom a permanent gastric fistula was produced by a gun-shot wound. Yet in spite of the numerous experiments made upon this man by Dr. Beaumont, no pain was experienced. Presumably, therefore, artificially produced fistulæ in animals are equally painless. In the chapter upon the nervous system, the important results obtained by Galen are described, and it is pointed out that the men who followed after him, though they worshipped his name, missed the whole meaning of his work through their neglect of the experimental method which he employed.

In his pathological chapters Mr. Paget gives a brief account of inflammation and suppuration, and then passes on to serum therapeutics. As the book is admittedly for general readers, it is a pity that no general introduction to this subject is given. The meaning of antitoxins and their method of preparation are nowhere described. The various chapters adduce a very copious body of facts as to the cure of diseases by serum-therapy and preventive inoculation, but the absolute necessity for experiments on animals, not only for the discovery and elucidation of the curative and preventive methods, but for the direct derivation of the immunising sera, is implied rather than clearly stated in so many words. In fact, it looks

rather as if the author had for the time being forgotten the primary object of his book, and had become so carried away by the intrinsic interest of his subject as to be oblivious to the fact that most of his readers must be entirely ignorant of the rudiments of preventive medicine. With this slight criticism we may pass on to enumerate some of the contents of this section. After chapters on anthrax and tubercle comes a very long one on diphtheria, in which an almost unnecessarily full list of statistics is given. In the chapter on rabies we have an admirable description of Pasteur's discovery and method of preparation of rabies virus. The cholera chapter is no less interesting. The plague chapter gives a detailed and most instructive account of the report of the Indian Plague Commission. Judging from the evidence adduced, this report seems unduly pessimistic, and one would have thought the commissioners entitled to go beyond their finding that "the method of serum-therapy is in plague, as in other infectious diseases, the only method which holds forth a prospect of ultimate success." In the typhoid chapter we are interested to learn that of the 12,234 officers and men forming the military garrison in the siege of Ladysmith, 1705 were inoculated against typhoid fever, and that amongst these the proportion of typhoid cases was only 1 in 48.7, whilst amongst the uninoculated it was 1 in 7.07. Still, there is nothing to indicate whether the inoculated were a fair sample of both men and officers, or were chiefly composed of the latter. The intensely interesting chapter on malaria and yellow fever gives an admirable epitome of the most important work done and results achieved in the elucidation of the cause and prevention of these diseases, and should be read by everyone who is compelled by circumstance to live near fever-haunted spots. Still other chapters deal with myxœdema, the action of drugs, and snake-venom, whilst the book closes with an account of the Vivisection Act and inspectors' reports.

H. M. V.

CHEMICAL TESTS AND THEIR DISCOVERERS.

Tests and Reagents, Chemical and Microscopical, known by their Authors' Names. Compiled by Alfred I. Cohn. Pp. iii+383. (New York: John Wiley and Sons; London: Chapman and Hall, Ltd., 1903.) Price 3 dollars.

THE appearance of this volume reminds one of two opposite tendencies that are developing in the terminology of modern chemistry. On the one hand, and more particularly in the "organic" division of the science, the chemist nowadays eschews all trivial or popular terms for his compounds, and strives to find appellations for them which shall be not merely names to remember the substances by, but titles which, at least to the initiated, are more or less self-explanatory. This is very meet and proper, and indeed some such system is probably unavoidable. But the union of the titular with the descriptive, *mariage de convenance* as it is, often produces some very ungainly offspring. Under the writer's eye there lies a recent volume of the *Journal of the Chemical Society*, several pages of which are plentifully besprinkled with such "names"

as Ethylbromoketohydroxydihydropentanthrenedicarboxylate, and this is by no means the worst example that could be cited. Mark Twain once remarked of certain German polysyllabic achievements that they were "not words, but alphabetical processions." Similarly one may say of productions like the one above quoted that they are not names, but descriptive sentences with the verbs left out.

On the other hand, the instinct for brevity—combined sometimes, perhaps, with a suggestion of hero-worship or a tinge of Chauvinism—has simultaneously asserted itself in the upgrowth of a kind of personal nomenclature for numerous things chemical and matters microscopical. We have A's test and B's process; C's reagent and D's reaction; E's "number" and F's "value"; G's theory and H's "law"; every month sees additions to the list; and of the making of these minor immortals there seems no end. Time was when the cognominal designation was a distinct convenience. Perhaps it is so still, but in proportion as the number of such titles increases their utility diminishes, and if the hyphenless monstrosities of organic chemistry are sometimes almost undecipherable from their length, the proper names have become confusing by their multiplicity.

These now need, in fact, a dictionary to themselves. So far as tests and reagents are concerned, such an aid is furnished by the present volume. It gives in alphabetical order many hundreds of proper names by which various chemicals and operations are more or less generally known, and after each name describes, usually in a few words, the essential features of the test or reagent with which the name is associated. Most of the matter has already been published serially by the compiler in Merck's Report, and the amplified instalments are now collected in a single volume, where they will be found very convenient for reference.

What chiefly strikes one on looking through the book is that its value would have been much enhanced by the inclusion of more references to original descriptions, of which, indeed, only a very few are actually given. The increased space required would, surely, have been amply compensated by the greater utility secured. On account of the condensed style in which the descriptions are generally written, they are apt to be sometimes obscure; indeed, their chief value in many cases is that of a reminder to one who is already more or less familiar with the operation described. A person who had never previously performed the experiments would often want more detail, but as to where he could obtain it the author gives him no inkling. Nevertheless, the book will be of service to the busy chemist or microscopist. It does not claim to be a complete record, but there is a good deal of information given, and it appears to be generally accurate in substance if sometimes awkward in expression.

An index of subjects closes the volume, and is rather a curiosity in its way, since the body of it is made up almost entirely of proper names. The book may well find a place with the compiler's "Indicators" on the shelves of the chemical laboratory, and will be found useful in the microscopist's workroom.

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